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ANNUAL REPORT

THE CENTRE OF FORENSIC SCIENCES
DEPARTMENT OF JUSTICE
PROVINCE OF ONTARIO

1970


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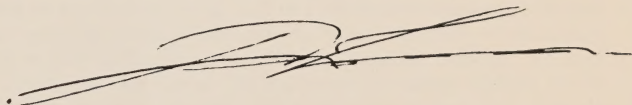
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The Honourable A. F. Lawrence, Q.C.,
Minister of Justice and Attorney General,
Parliament Buildings,
Toronto, Ontario.

Dear Sir:

I have the honour to submit the annual report regarding the activities of the
Centre of Forensic Sciences for the calendar year 1970.

Respectfully submitted,

A handwritten signature in dark ink, appearing to be 'D. M. Lucas', written in a cursive style with a long horizontal stroke extending to the right.

D. M. Lucas, M.Sc.
Director.

REPORT OF THE DIRECTOR

The Centre of Forensic Sciences came into being in 1966 with the passing of an Order-in-Council changing the name of the Attorney General's Laboratory and setting up the Advisory Council in Forensic Sciences. The Attorney General's Laboratory had been organized in 1951 by the late Dr. H. Ward Smith.

The objectives of the Centre are:

- a) To apply the principles of forensic science to assist in law enforcement and the administration of justice in the Province of Ontario.
- b) To conduct, direct and promote education programmes in forensic science for law enforcement and administration of justice officers, officers of the courts and faculties of medicine, science and law in close cooperation with the administration of the universities.
- c) To conduct and promote research programmes in forensic sciences.

The Centre is a Branch of the Public Safety Division of the Department of Justice of the Province and is totally supported financially by the Department of Justice.

The Centre of Forensic Sciences in Toronto is the only provincial forensic laboratory in Ontario and thus provides services for the entire province. These services include pathology, toxicology, biology, chemistry, firearms examination and document examination. All are provided at no cost to all official investigative bodies and to defence counsel in criminal cases in the province. In addition, some of the services are available to counsel in civil cases in those aspects of forensic science where such services are not elsewhere available. Fees are charged for services in civil cases with the fees being paid to the Provincial Government.

All cases are examined by qualified forensic scientists who are available to provide testimony as to their findings and the interpretation of their findings. No charge is made for court appearances except in civil cases. The present staff complement is eighty, all but fifteen of whom are professionally or technically qualified in their various specialties. This staff serves a population of about 7½ million people distributed over an area of 412,582 square miles.

During 1970 the staff of the Centre expanded slightly as the complement was increased to eighty from seventy-six. This increase allowed for some relief of pressures in existing services and made possible a small expansion of services. The latter was a result of the addition to our staff of a mechanical engineer. The need for such services had become very apparent over the years as material was being submitted to the laboratory by police and coroners for examination in fatal industrial accidents and automobile fatalities. Most of this material had to be referred to outside consultants. As forecast, the utilization by various agencies of this service is already expanding rapidly. A textile technician was added to the Biology Section and steps are now being taken to catalogue and expand our fibre reference collection to increase the value of fibre evidence. A technician was also added to the Toxicology Section. Approval was received to purchase a station wagon and hire a driver. This has greatly reduced the loss of valuable time of our professional staff on minor errands, expedited travel of staff to the courts in the immediate area and improved the transfer of materials between the Centre's two locations.

The Centre and the University of Toronto continued negotiations for the services of a forensic pathologist throughout the year. There can be no doubt that the protracted nature of these negotiations has been a serious detriment to the efficient provision of our services in the area of forensic pathology. The Centre has been without a full time pathologist for two years; however, it is hoped that the necessary agreement with the University will be reached in the near future.

The physical facilities of the Centre remained unchanged in 1970 creating increased apprehension about the many problems associated with the serious overcrowding. Although working drawings for a new building on Grosvenor Street in Toronto were completed in 1969, budgetary restrictions have prevented approval for construction. It is hoped that this approval will be received in 1971. Until these facilities become available, our ability to expand and improve our facilities will be severely limited. Indeed, we will be forced to continue to deliberately limit the numbers and restrict the types of cases accepted for examination.

CASES

SECTION	1965	1966	1967	1968	1969	1970	% Change
							1969/1970
Pathology	105	136	212	166	73	50	— 31.5
Biology	375	454	520	535	560	587	+ 4.8
Toxicology	3252	3896	4928	4584	3885	3077	— 20.8
Firearms	191	221	179	266	279	350	+ 25.5
Chemistry	545	579	671	667	735	768	+ 4.5
Documents	509	604	754	900	1133	1247	+ 10.05
Photography							
from outside agencies	—	—	—	11	8	15	+ 87.5
from other sections	—	—	—	—	385	394	+ 2.4
TOTAL CASES	4977	5890	7264	7129	6673	6094	— 8.7

EXHIBITS

Pathology	710	1025	224	189	145	65	— 55.2
Biology	3096	4018	4383	4192	5059	4999	— 1.2
Toxicology	5804	7796	9208	7620	7744	6877	— 11.1
Firearms	1219	1333	1102	1254	1039	1361	+ 31.0
Chemistry	2650	2623	3148	2829	3049	3348	+ 9.8
Documents	3885	4984	6174	7036	9127	13120	+ 43.7
Photography	—	—	—	46	28	46	+ 64.3
TOTAL EXHIBITS	17364	21779	24239	23166	26191	29816	+ 13.5

TABLE I

The challenges presented by the changes in legislation dealing with drinking and driving were substantial but most were adequately met. As a result of the planning and gradual development of a large scale breath testing programme by the Centre over the past fourteen years, Ontario was better prepared for the new legislation than any other province. Although there were some problems resulting from individual court decisions, none of these seriously affected the overall programme and Ontario has had fewer problems than the other provinces. Increased demands for equipment and training were only partially met because of budgetary restrictions. The great increase in demand for essential supplies was met and the number of breath tests performed increased from 18,042 in 1969 to 29,716 in 1970.

During the year, arrangements were made with the Commissioner of the Ontario Provincial Police to have a constable who is an experienced Breathalyzer operator seconded to the staff of the Centre. The purpose is to enhance the quality of the Breathalyzer programme by field inspections of the instruments and re-

ACTIVITIES

SECTION		1965	1966	1967	1968	1969	1970
Pathology	Court	12	58	43	33	36	5
	Days Spent	15	63	35.5	30	19	3½
	Lectures	12	19	19	23	—	—
	Mileage	1800	3932	3600	1834	220	264
Biology	Court	192	244	232	199	216	205
	Days Spent	280	224	239	191	199	184½
	Lectures	24	98	92.5	80.5	15	97
	Mileage	39000	45531	45533	59093	66374	66383
Toxicology	Court	137	207	148	127	172	132
	Days Spent	166	237	127.5	111	127.5	95½
	Lectures	132	280	52	138	392	529
	Mileage	29200	41310	24890	16642	33783	17301
Firearms	Court	79	74	60	65	87	109
	Days Spent	92	103	79.5	94	114.5	114½
	Lectures	75	95	59	8	10	31
	Mileage	16600	20415	16071	23086	26525	31098
Chemistry	Court	125	167	194	200	208	188
	Days Spent	95	135	160.5	183	240	226½
	Lectures	30	61	137	87.5	71.5	113
	Mileage	20700	28592	33048	60352	56202	54573
Documents	Court	50	75	115	92	107	154
	Days Spent	60	123	109	107.5	112.5	143
	Lectures	20	18	76	10.5	10.5	4
	Mileage	17000	13004	18984	27786	20069	17181
Photography	Court	—	—	—	3	2	5
	Days Spent	—	—	—	2	1.5	2½
	Lectures	—	—	—	4	2	6
	Mileage	—	—	—	3650	2762	1550
Administration	Court	5	—	—	11	12	5
	Days Spent	5	—	—	16	14	1½
	Lectures	110	—	—	117	89	101
	Mileage	30200	—	—	15280	12370	10220
TOTAL	Court	600	825	792	730	840	803
for	Days Spent	713	940	751	734.5	828	781½
CENTRE	Lectures	413	618	435.5	468.5	590	881
	Mileage	154500	155599	142126	207723	218305	198570

TABLE II

CASES

EXHIBITS

SECTION	SOURCE	1967	1968	1969	1970	1967	1968	1969	1970
Pathology	Metro	90	40	4	5	90	40	4	6
	O.P.P.	28	40	24	31	34	42	55	45
	Mun. P.D.	18	15	14	7	17	17	24	7
	Other	76	71	31	7	83	90	62	7
	Total	212	166	73	46	224	189	145	65
Biology	Metro	154	159	167	167	1360	954	1139	1228
	O.P.P.	161	164	180	185	1595	1675	2055	2047
	Mun. P.D.	197	198	191	217	1405	1510	1790	1651
	Other	8	14	22	18	23	53	75	73
	Total	520	535	560	587	4383	4192	5059	4999
Toxicology	Metro	248	166	165	98	474	314	288	266
	O.P.P.	1268	1201	1089	773	2209	2026	2092	1396
	Mun. P.D.	720	721	600	482	1280	1256	1327	1089
	Other	2692	2496	2031	1724	5245	4024	4037	4126
	Total	4928	4584	3885	3077	9208	7620	7744	6877
Firearms	Metro	32	65	63	81	184	235	187	171
	O.P.P.	92	113	131	132	612	587	544	654
	Mun. P.D.	47	77	71	129	277	354	277	504
	Other	8	11	14	8	29	78	31	32
	Total	179	266	279	350	1102	1254	1039	1361
Chemistry	Metro	120	92	90	111	511	381	286	454
	O.P.P.	242	265	326	262	1207	1141	1483	1244
	Mun. P.D.	239	224	211	265	1179	1016	889	1184
	Other	70	86	108	130	251	291	391	466
	Total	671	667	735	768	3148	2829	3049	3348
Documents	Metro	85	88	99	111	1168	1311	2486	3894
	O.P.P.	360	412	419	535	1743	1839	2090	3751
	Mun. P.D.	270	325	565	535	2503	2680	3708	4333
	Other	39	75	50	66	760	1206	843	1142
	Total	754	900	1133	1247	6174	7036	9127	13120
Photography	Metro		5	5	5	—	13	23	11
	O.P.P.		2	1	8	—	3	1	33
	Mun. P.D.		4	1	2	—	30	3	2
	Other		—	1	—	—	—	1	—
	Total		11	8	15	—	46	28	46
TOTAL for CENTRE	Metro	729	615	593	577	3787	3248	4413	6030
	O.P.P.	2150	2197	2170	1923	7400	7313	8320	9170
	Mun. P.D.	1491	1564	1653	1637	6661	6863	8018	8770
	Other	2893	2753	2257	1953	6391	5742	5440	5846
	TOTAL	7263	7129	6673	6094	24239	23166	26191	29816

TABLE III

evaluation of the operators. This programme will ensure a continuing high standard of performance of both operators and equipment.

Table I shows the numbers of cases and exhibits examined in 1970 together with the figures for the previous five years for comparison. Although there was a decrease of almost 9% in the total number of cases from 1969, this decrease occurred entirely in the Pathology and Toxicology Sections. The former was due to the lack of staff and the latter to the restrictions on the types of cases accepted which were introduced in September of 1969. There was an increase in the number of cases examined in all the other sections.

In spite of the decrease in the total number of cases, the number of individual exhibits examined increased by 13.5% and there was therefore a significant increase in the total workload of the Centre.

The number of requests for services in civil cases doubled from fifteen in 1969 to thirty in 1970. These cases returned \$3,375. in fees to the Treasurer of Ontario.

Activities other than case work are shown in Table II. Although there was a slight decrease in the number of court appearances, they continued to be required in almost 8% of the cases examined. The most significant change in 1970 was the increase in the number of hours of lectures given. Allowing for the time required to travel to the sites of some of these, they represent the equivalent of well over one man year. This increase was largely due to an increase in the number of Breathalyzer courses given; however, there was a 15% increase in the number of lectures given at the Ontario Police College at Aylmer and at the Metropolitan Toronto Police College. Although staff and space shortages caused us to discontinue tours of the Centre by high school science clubs, there still were twenty-three tours totalling about 620 persons from related professions.

Table III lists the numbers of cases and exhibits by source. The "other" column refers primarily to coroners and pathologists, but also includes the Ontario Fire Marshal's Office, the Ontario Securities Commission, the Provincial Departments of Labour, Lands and Forests, Correctional Services and Energy and Resources Management, the Railway Police Departments, the Canadian Armed Forces, and the Aircraft Accident Investigation Branch of the Federal Department of Transport.

Table IV shows the distribution of cases by type of case.

TABLE IV

Type of Case	1969	1970
Sudden Death	27.0%	26.0%
Fraud	16.3	18.1
Fatal M.V.A.	15.1	11.9
Impaired Driving	8.0	7.2
Break & Entry, Robbery	5.4	7.2
Homicides and Attempted Homicide	4.0	4.8
Hit & Run	3.4	3.5
Miscellaneous Analysis and Identifications	3.9	3.1
Arson and Explosives	2.0	3.0
Clinical Toxicology	3.6	2.8
Rape	2.4	2.8
Other Sex Offences	2.1	2.5
Illegal Possession of Firearms	1.2	1.4
Assaults	1.0	1.3
Miscellaneous Traffic Offences	1.2	.8
Others	3.4	3.7

A major revision of the instruction booklet "Laboratory Aids for the Investigator" was undertaken under the leadership of the Deputy Director during the year. It is anticipated that the new edition will be completed and distributed to police officers, coroners and other investigators early in 1971.

The Director presented a paper "The State of the Art of Criminalistics" at the annual meeting of the American Academy of Forensic Sciences in Chicago in February and the Deputy Director presented "A Brief

Report on Hair Comparison" at the annual meeting of the Canadian Society of Forensic Science in Banff in September.

An interesting examination was undertaken by the head of the Firearms Section at the request of an author researching a book on the trial of Patrick James Whelan. Whelan was convicted at Ottawa in 1868 of the murder of a member of parliament, Thomas D'Arcy McGee—the first political assassination in Canada. The bullet which killed McGee still rests in the Ontario Public Archives and we were asked to examine it in an attempt to establish the rifling characteristics of the weapon which fired it. Although the bullet was in a poor state of preservation and retained only one land and groove impression as shown in Fig. 1, it was possible to learn enough from it to indicate that it was probably fired from one of two types of revolvers, one of which Whelan was known to possess.



FIG. 1

On July 5th, 1970, an Air Canada DC8-63, Flight 621 en route from Montreal to Los Angeles with a stop in Toronto crashed violently in a farmer's field a few miles northeast of Toronto International Airport. The 109 persons on board were killed instantly. The bodies were so terribly fragmented that over 800 portions of human remains were spread over an area of about 520 feet by 410 feet and intermingled with tons of aircraft wreckage, baggage, freight and mail.

The accident investigators requested the assistance of the Centre in the examination of specimens from the flight deck crew for drugs or poisons, none of which were detected. They also requested our services in the examination of blood stains, tissue, hair and paint particles on articles from the flight deck in an attempt to position the three flight deck crew at the moment of impact. In all, 126 individual items were examined requiring hundreds of man hours to complete.

The Supervising Coroner of Ontario asked the Director to organize the pathology unit and to coordinate the activities of all the units engaged in the identification of the human remains. This activity occupied the Director and several other members of the staff for three weeks at the temporary morgue in the Woodbridge Memorial Arena. Eighty-nine of the 109 persons on board were eventually identified, twenty by fingerprints, forty-four by dentition, one by radiology, five by surgical evidence and nineteen by property attached to the remains.

The procedures developed in this disaster proved to be highly effective. Indeed, the limiting identification factor was not the information available at the autopsy table but the information about the passengers available from the next of kin. As a sequel to their work on this case, many of our staff took the opportunity to have their fingerprints recorded by the Ontario Provincial Police.

REPORTS OF THE SECTIONS

PATHOLOGY

During 1970 the section continued to operate under the Acting Medical Director who served on a part-time basis. Most of the cases seen involved problems of identity while the remainder consisted of cases referred to the section by regional pathologists, police officers or other sections of the Centre.

Organs or tissues referred to Section		13
Identification problems		34
Skeletal remains or decomposed		
bodies	18	
Remains recovered after a fire	4	
Bodies recovered from water	3	
Remains of archeological interest		
only	5	
Animal remains	4	
Other autopsies referred to Section		3
		—
	TOTAL	50
		—

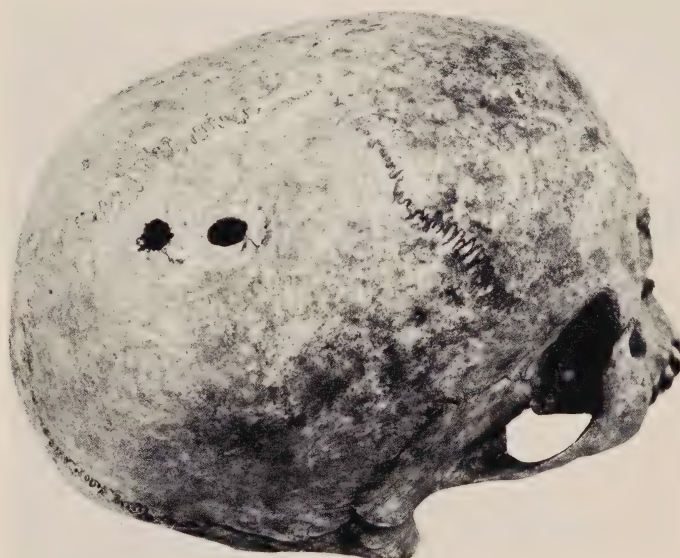


FIG. 2

An interesting and, so far, unsolved case concerned some skeletal remains found with remnants of clothing in a swamp near Guelph. These were remains of a male individual, almost 50 years of age and appeared to have been in the swamp approximately 25 years. Two closely adjacent bullet entrance wounds were found on top of the head (Fig. 2) and one bullet was recovered from inside the skull. The nature and location of the bullet wounds marked them clearly as homicidal but in spite of the case having been shown on television no information has been received concerning the identity of the victim.

The consultation service of the Section continued to be extremely widely used by regional pathologists, coroners and police officers.

BIOLOGY

The Biology Section deals mainly with stains of body fluids such as blood, saliva and semen. Hairs and fibres are also identified and compared as well as botanical materials in the form of wood-chips, plants, plant products, etc.

As in past years the demand for the services of the Biology Section has continued an upward trend in 1970. The number of cases submitted increased from 560 in 1969 to 587 in 1970. Included were a number of homicide investigations where the search for an accused extended over several months. During the course of these investigations many items were submitted for examination requiring many additional man hours beyond the normal. One such investigation commenced in June 1970 and is still in progress. It has already required the expenditure of over 250 man hours. Mr. Pinto, a senior examiner in the section, has carried out analysis on samples submitted from over 500 suspects in connection with this investigation.

A considerable amount of time and effort also was expended by Mr. Erickson and other members of the section in assisting in the investigation of the crash of an Air Canada DC-8 in July of 1970.

During 1970, the Biology Section had a net gain of two members. One person resigned at the end of his twelve-month probationary period. Two persons joined the scientific staff; Mr. Keith Kelder an honours graduate in Microbiology joined in May and Mr. Brian Jay, an honours graduate in Biology, in July. Both are undergoing the two year training programme under the direction of Mr. von Gemmingen. Miss Rose-Lynn Fair a graduate in Fibre Technology from Mohawk College joined in June. She is working on the development of our fibre identification programme under the direction of Mr. Towstiak.

RESEARCH AND DEVELOPMENT

During 1970 the techniques for the identification in blood stains of the enzymes Phosphoglucosomutase and Adenylate Kinase have been evaluated with good results. Staff training in the use of these techniques is now in progress.

Modified techniques for the identification of the MN system and A_2 in blood stains have been further developed and are under evaluation for selective use in case work.

Techniques for the identification of enzyme systems in blood stains other than PGM and AK are being researched and evaluated. This research programme is being conducted by Mrs. Newall on a part-time basis. She is also carrying out research on the use of two-dimensional immunoelectrophoretic techniques for the differentiation of blood in stains.

A paper on "The Effect of Washing on the Detection of Blood and Seminal Stains" by J. Spector and D. von Gemmingen was read at the Annual Meeting of the Canadian Society of Forensic Science at Banff in September and published in the Journal.

ILLUSTRATIVE CASES

1. A number of valuables, including a vacuum cleaner, were stolen from a private residence. A vacuum cleaner corresponding to the stolen vacuum cleaner was found in the house of a suspect. The vacuum bag and its contents were submitted for examination. Rug samples from the house of the suspect and the house of the complainant were also submitted. The contents of the vacuum bag included turquoise polypropylene fibres, turquoise nylon fibres and human scalp hairs, the structure and appearance of which suggested they were from an infant.

The wall to wall carpeting in the house of the complainant was a mixture of turquoise polypropylene and nylon fibres. The complainant had an infant son with hair similar to the hairs in the vacuum bag. No fibres or hairs similar to the material from the vacuum bag were found in the residence of the suspect. He was charged and pleaded guilty to the offence.

2. The body of a woman was found with evidence of beating about the head and a stab-like wound in the neck. Her husband was charged with murder. The pathologist found a knife blade tip in the wound in the neck. The knife blade tip was compared with the broken blade of a pen knife found in the trousers

pocket of the accused. The configuration of the break line and the striations on the blade tip corresponded in detail to those of the portion of the broken blade (Fig. 3).

Among the various other items examined were a pair of boots belonging to the accused. The toe area was reinforced with metal inserts and was splattered with human blood of the same group as the deceased's. There were ten scalp hairs embedded in the blood on the boots. The hairs, a number of which bore evidence of forcible removal, were similar in colour and characteristics to hairs from the scalp of the deceased.

The accused was found guilty of non-capital murder.

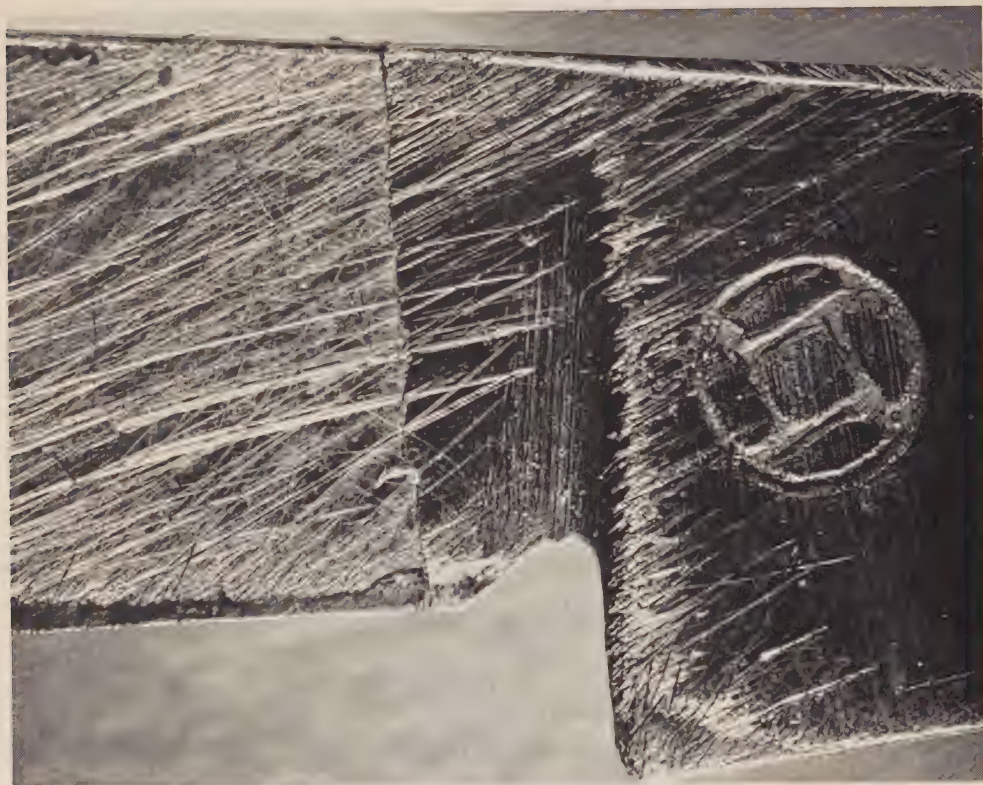


FIG. 3

3. A place of business was broken into by a person using an axe to break down a door. A suspect was apprehended a short time later and his clothing submitted to the Centre along with samples of wood from the broken door. The material of the door consisted of Douglas Fir and Eastern or Western Fir. Fragments of Douglas Fir and Eastern or Western Fir were found adhering to the clothing of the accused. Two chips of wood removed from the hair of the head of the accused were Douglas Fir.

4. A small child was found dead at the edge of a rural road near a railroad crossing, the victim of a hit and run driver. A local resident was suspected, however he denied any knowledge of the incident. The investigating officer noted what appeared to be a fabric imprint on the bumper of the suspect's automobile.

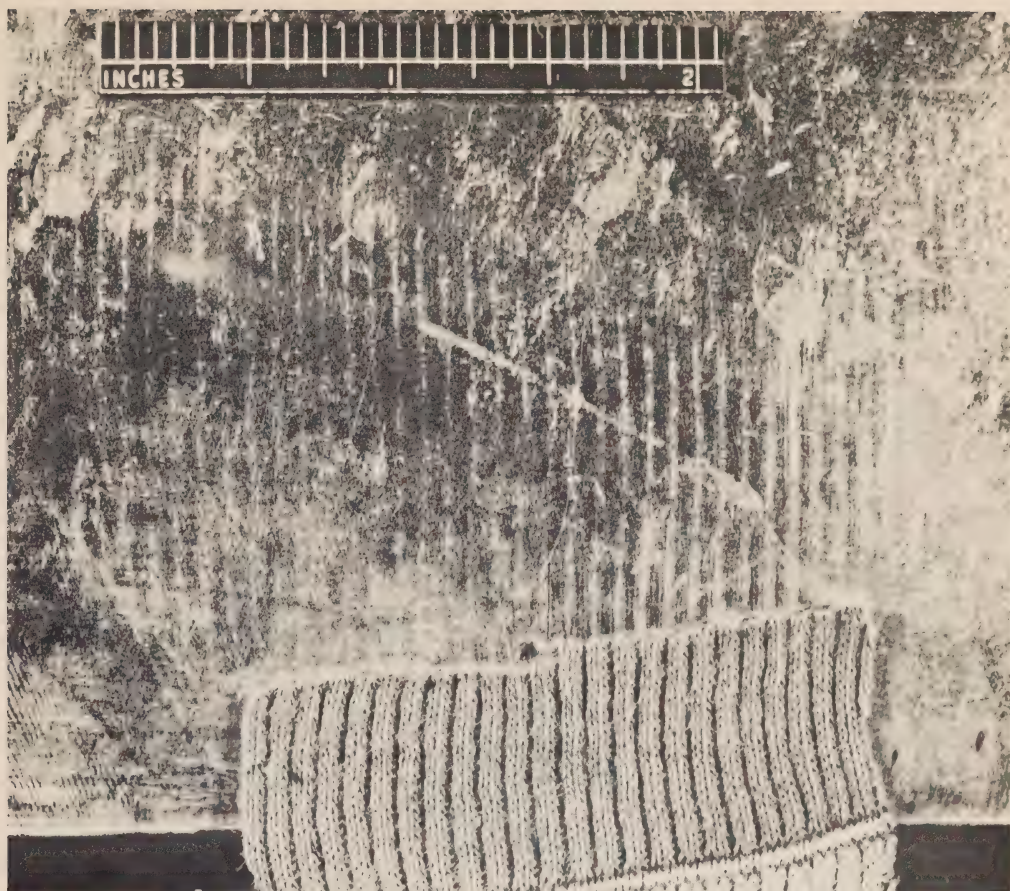


FIG. 4

The weave pattern of the clothing of the deceased was compared with the imprint on the bumper and found to correspond (Fig. 4).

When the suspect was confronted with this information he admitted his guilt.

5. A 14 year old girl complained to the police that she had been forced into a car, taken to a house and raped on a bed by three youths. Material received by the Centre established that the complainant was a group "B" secretor. Two of the accused were group "O" secretors and the third accused was a non-secretor.

The spread from the bed was examined and a number of seminal stains as well as blood were identified. Group "O" substance, group "B" substance and a seminal stain from a non-secretor were identified on the bed spread.

The material from the genitalia of the complainant contained spermatozoa and grouping results were compatible with the semen having come from one or more of the accused. Group "B" substance was identified on the undershorts worn by one of the accused at the time of the alleged offence.

This corroborative evidence from the Centre was of considerable value to the investigation.

FIREARMS AND TOOLMARKS

The Firearms Section conducts microscopic examinations of fired bullets and cartridge cases to identify the firearms from which they came. Clothing and tissue are examined for powder residues to determine the muzzle to target distance. The section also restores obliterated serial numbers and property marks on firearms. Toolmark examinations (e.g. lock plates, jimmy bars, screwdrivers, wire cutters) are also performed by this section.

Despite a conscious effort to limit nonessential examinations, there was an increase of approximately 25% in the number of cases received during 1970 (from 279 to 350) with a corresponding increase of approximately 31% in the number of exhibits examined (from 1039 to 1361). In 1969 the section examined items from 34 homicide cases involving firearms. In 1970, items from 63 homicide cases involving firearms were examined. These activities resulted in an increase of approximately 25% in court attendances.

ILLUSTRATIVE CASES

1. Early in the spring a Southern Ontario Rod & Gun Club was burglarized and a safe broken into. A suspect was questioned and, as a result, fourteen different tools, the lock case, the lock case cover and the various internal parts of the combination lock were submitted for examination. The lock case was completely disassembled revealing the presence of many impressed tool marks on the inside surface of the lock case cover. The damage could only have been produced by punching through the spindle tube hole. Examination of the tools submitted indicated that only one, a pin punch, was of sufficiently small diameter to be put through the spindle tube hole and strike the inside surface of the lock case cover. Tests were made using the pin punch and microscopic comparison with the marks on the inside of the lock case cover indicated that they had been made by the pin punch submitted. The suspect was convicted.

2. In March a house fire was discovered on the northern outskirts of Toronto. Upon the arrival of the police department, the house was almost completely burned down. It was learned that the owner of this house was a 78 year old widower who lived alone.

Examination of the debris in the basement uncovered some bones including a human skull and pelvis but nothing that would establish a positive identification of the victim. It was known that the owner kept large sums of money in the house and always kept a double barrel shotgun and shells beside his bed. A search was made for the gun with negative results. Due to this and other circumstances this death was treated as a possible homicide.

The remains were examined by the Pathology Section for anything that would assist in identification and for any signs of shotgun injuries. None were detected. They did find four burnt 12 gauge brass shotgun shell bases in the debris. Examination of these four bases (Fig. 5a) revealed that all the primer cups (which held the priming mixture and anvil) appeared to have been blown out of the base battery cups. Control samples (Fig. 5b) of fired shot shells, primed empties and unfired shot shells were subjected to extreme heat in a wood and gasoline fire. Comparison of these bases with (Fig. 5a) indicated that the shotgun shells from the house had exploded in the fire and had not been discharged in a firearm.

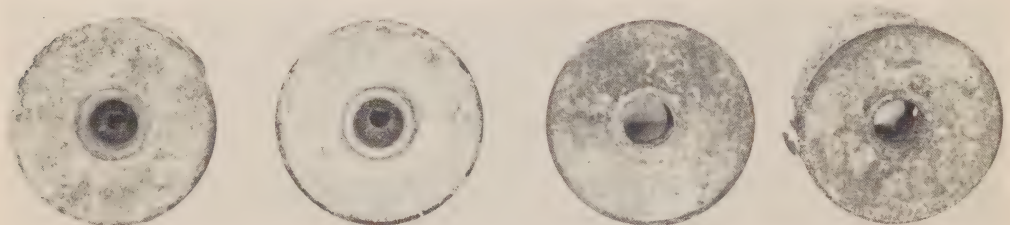
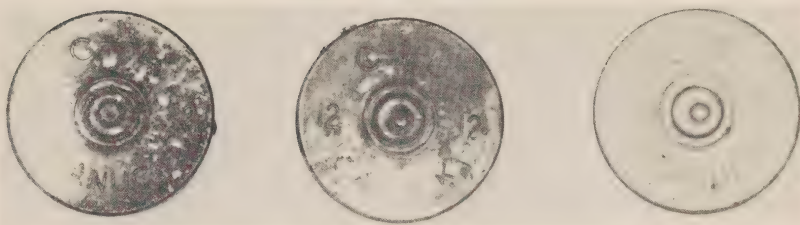


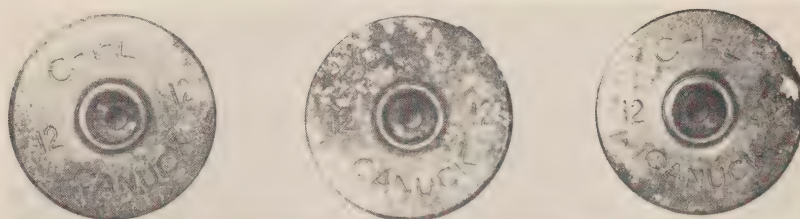
FIG. 5a

EXPLODED CONTROL SAMPLES

FIRED SHOTSHELLS



PRIMED EMPTIES



UNFIRED SHOTSHELLS

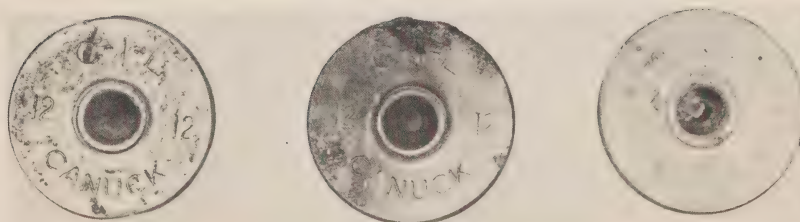


FIG. 5b

CHEMISTRY

Most examinations in this section are made on exhibits from cases of Break, Enter and Theft, Arson and Traffic Offences, and the materials examined are most commonly paint, glass, soil and petroleum products. In addition to chemical analyses, many examinations are carried out which deal with problems which no self-respecting science would own.

Thirty-three more cases were handled in this section during the past year than during 1969. This represents a 5% increase. There was a correspondingly modest increase in court appearances and time away from the laboratory by members of this section.

The long-felt need for a mechanical engineer has been filled by Mr. Eric Krueger, B.A.Sc., P.Eng., who joined our staff in November. Mr. Krueger has extensive engineering experience, six years of which he gained as a member of the Mechanical Engineering Division of the Ontario Research Foundation. We now have in Mr. Li and Mr. Krueger a pair of engineers well qualified to supply mechanical and metallurgical testing services in investigations of industrial and traffic accidents and other occurrences.

RESEARCH AND DEVELOPMENT

There has been a marked increase in recent years of cases involving the theft of copper wire. Present day procedures for refining copper give a product of 99.99+ % purity; such small traces of impurities as remain cannot be quantitatively determined by most chemical methods. Since neutron activation analysis has extreme sensitivity, an attempt was made to differentiate copper wires by this method. Samples of copper wire obtained from current factory production and older samples collected from case work were subjected to neutron activation analysis. The analytical results showed a wide variation among all the samples for three of five elements analyzed. The data thus far obtained also suggest that older wire may well be distinguished from currently produced wire by its considerably higher content of impurities. This is the first time that a procedure has given results which show promise of differentiating copper wire.



FIG. 6

ILLUSTRATIVE CASES

1. Fig. 6 shows an electric motor allegedly stolen from a boathouse which was seized from a suspect's residence. Fig. 7 shows the planks on which the stolen motor had been mounted. The motor was known to have been moved on its mounting and a close examination of the planks showed two impressions, both of which matched the base of the motor. Photographic transparencies were made to actual size of the motor

base and the pattern on the mounting planks. When superimposed, the distinctive features were seen to coincide in all respects. Several minute spots of green and droplets of light brown overspray paint on the motor corresponded to similar paint on the mounting planks.

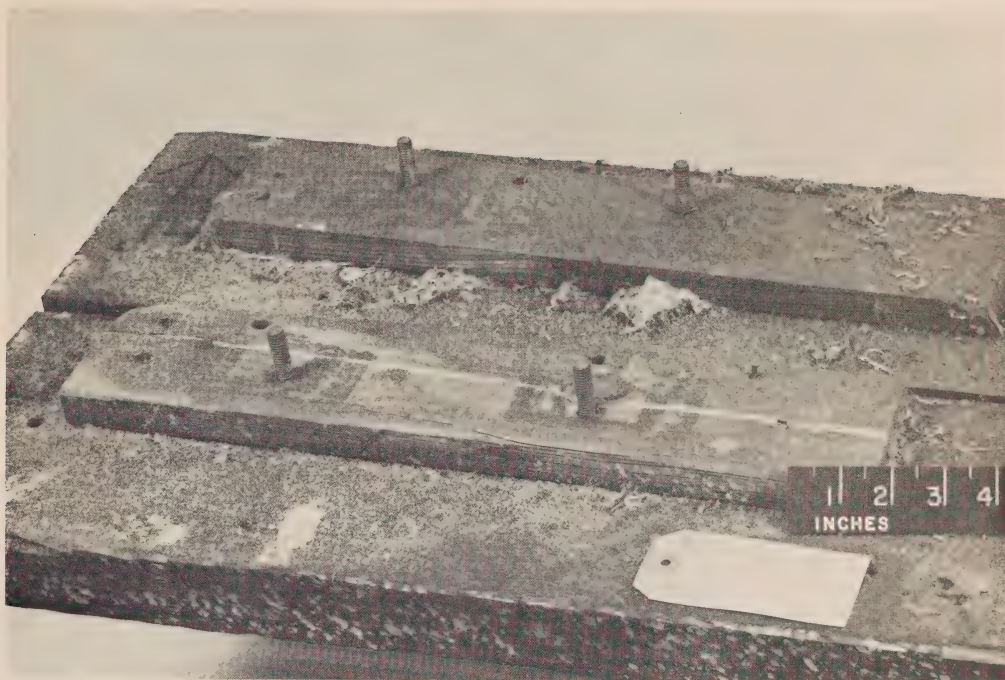


FIG. 7

2. A cable comprised of 37 strands of copper was allegedly stolen. A control sample was obtained from the premises where the theft occurred for comparison with portions of cable found in a suspect's automobile. The cable was made in such a way that 36 strands of copper wire twined about a central wire. Triplicate samples of the central wire in both control and suspect cables and one arbitrarily selected strand of the control were analyzed for trace elements. The analytical results showed close agreement of trace elements (selenium, gold, antimony, silver) in the central wires of control and suspect cables while the trace elements in the arbitrarily selected wire were somewhat different from these values. These findings suggested a common origin of control and suspect cables.

3. During one night an Ontario city suffered a series of break-ins, most of them were accomplished by smashing glass from a door or window. Glass samples from six premises were submitted to the Centre together with clothing from the suspects and debris from the floor of their car. In the samples from the suspects, glass particles were found matching in physical properties all six of the control samples. The glasses from the six premises were also clearly distinguishable one from the other illustrating the variation in physical properties of window glass.

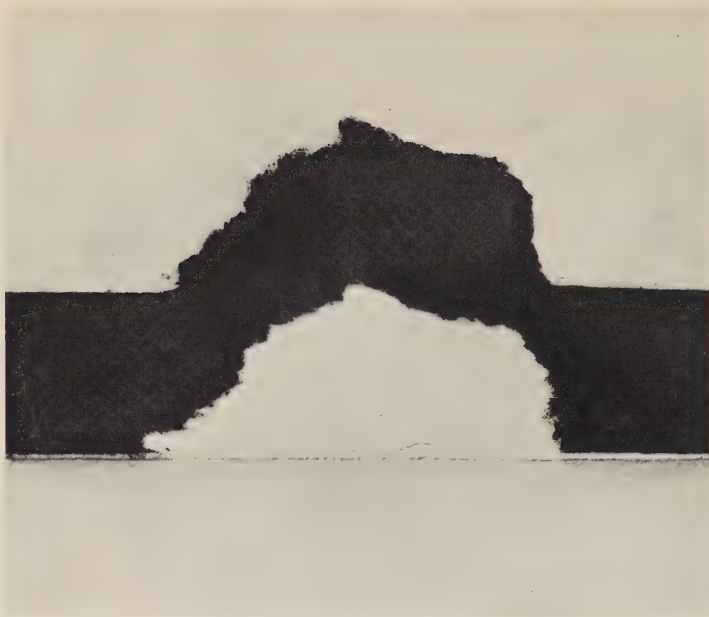


FIG. 8

DOCUMENT EXAMINATION

The main function of this section is to determine whether or not any piece of incriminating writing was written by any of the persons suspected of a crime. Sometimes the questioned document is typewritten and the section determines whether or not a particular typewriter was used to type it. Sometimes documents are altered, erased or charred and the section attempts to decipher them. A related operation involves the investigation of whether or not a passer of a cheque has defrauded any other victim in the past under any other name. This involves the classification of handwriting and other characteristics of cheques in the Fraudulent Cheque File. The usual types of cases handled by this section involve fraud, forgery, anonymous and threatening letters, suicide notes and gambling records.

1,247 cases were examined as against 1,133 in 1969, an increase of 10%. Fraudulent Cheque File cases increased slightly more than other cases.

RESEARCH AND DEVELOPMENT

The handwriting classification system used in the Fraudulent Cheque File was re-designed for speedier classification by non-document examiners who would require only two to three months training in its use. A computer programme for this system was written and tested by Mr. C. de Vries, a 3rd year student of computer science at Waterloo University, during the summer using a time-sharing terminal installed in the Centre. It is expected that computerization of this work will be completed this year.

A paper, "CHECLASS — A Classification System for Fraudulent Cheques," prepared by Mr. Schroeder, has been submitted for publication in the Journal of Forensic Science.

ILLUSTRATIVE CASES

1. A note in Italian, attempting to extort \$500.00 from a person, was examined and compared with the writing of a suspect and with the writing pad found in his house. The examination of the writing was inconclusive but the torn edges of the note and the pad matched, showing that the note was torn from the pad (Fig. 8). The suspect was charged and pleaded guilty.

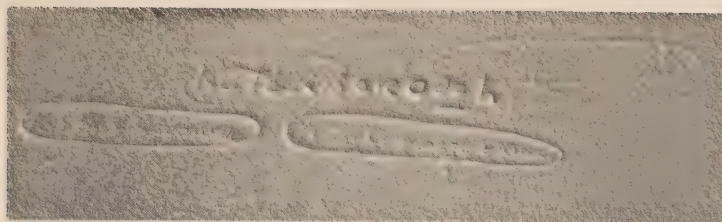


FIG. 9a

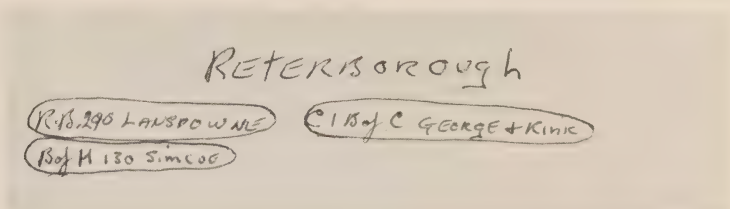


FIG. 9b

2. A Toronto auto salesman and his friend passed more than 400 fraudulent cheques valued at \$75,000.00 at several banks throughout Southern Ontario. They would first steal two genuine cheques from mail boxes. A genuine cheque leaf from the branch of the bank on which one of the cheques was drawn would then be presented for payment at the other bank. It would bear the payer's signature copied from the stolen cheque drawn on the first bank and an endorsement signature and account number copied from the cheque drawn on the second bank. The investigation was conducted by Ontario Provincial Police and Metropolitan Toronto Police officers who brought in scores of documents for examination over a period of several months. The two men were finally arrested and charged with forgery, uttering forged documents, conspiracy to defraud and possession of instruments of forgery. Four lists of banks they had planned to defraud were found in the car of one of the accused and were in his handwriting. A writing pad was found in his house and indentations were detected on the top page of the pad. These corresponded with writings on both sides of the four sheets found in the car. The accused were both sentenced to five years' imprisonment. Fig. 9a shows the top page of the writing pad and Fig 9b some of the matching writing from one of the four sheets of paper containing lists of "victims."

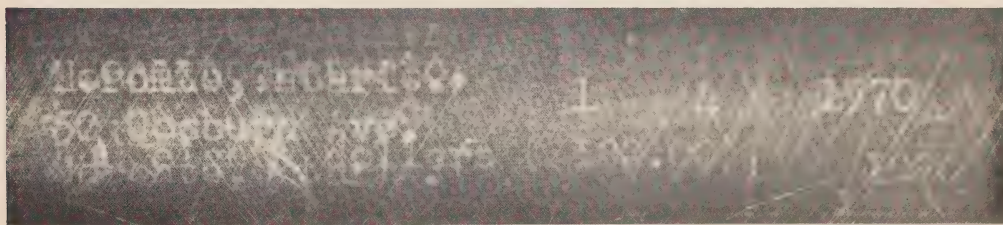


FIG. 10

3. A province-wide investigation into the activities of a gang engaged in counterfeiting Government of Canada Bond interest cheques resulted in charges against fourteen persons. Two were never found, eleven pleaded guilty and one, a woman, pleaded not guilty. Experts from the R.C.M.P. and the Bank of Canada testified that the cheques were counterfeit. Sixteen of them, totalling \$2,500.00 were uttered. Eighty-three totalling \$7,500.00 were seized in a motel room together with a typewriter. The platen from the latter was photographed bringing out writing consisting of some dates, nine amounts in words and figures and three names and addresses. (Fig. 10). Examination of the ribbon revealed twenty-six amounts and thirty-seven names and addresses which matched the names and addresses on some of the cheques seized.

TOXICOLOGY

The Toxicology Section is primarily concerned with examinations of alcohol, drugs and chemical poisons in biological and other specimens arising from investigations of a medico-legal or criminal nature. In addition, the section is responsible for the administration of the Breathalyzer programme for the province.

Four new people joined the technical staff of the section during 1970. Three of these filled vacancies resulting from resignations in 1969. The new staff members are: Mrs. E. Kang, B.S.M.T.; Mrs. S. Fitzsimmons, a graduate of Hamilton and District School of Medical Technology; Mr. K. Lawrence, a graduate of Ryerson Polytechnical Institute and Miss J. Fenwick, a Fellow of the British Institute of Medical Laboratory Technologists. Mrs. G. Uchimarui replaced Mrs. Smithers as a secretary.

There were 3,077 cases completed in 1970 as compared with 3,885 in 1969, a decrease of about 20%. This decrease was mainly in the less essential and usually simple types of cases and was a direct result of our policy of discouraging the acceptance of these cases until adequate facilities and staff are available. Overall, however, the work in the section has increased considerably in complexity in recent years due to the influx of new drugs (both legitimate and illegitimate) in our society, and to the increased interest in multiple drug analysis by coroners and pathologists.

The number of court attendances decreased from 1969. This decrease was in court appearances in Impaired Driving charges and was attributed to the amendments to the Criminal Code of Canada which made the interpretation of blood alcohol concentrations in excess of 80 mgm. per 100 ml. unnecessary.

During 1970 there was an increase in the number of hours spent in lecturing due to the increased number of Breathalyzer training courses offered.

The Breathalyzer programme expanded significantly during 1970 because of legislative changes. The duties have been enlarged to include field inspections of Breathalyzers and operators. A detailed report of this programme is given in Appendix B.

RESEARCH AND DEVELOPMENT

A number of projects were directed toward the development or improvement of methodology for drugs which pose analytical problems.

The project dealing with the evaluation of the freeze-drying technique in toxicological analysis has provided useful information about this procedure. It would appear, however, that this technique does not offer advantages over the tungstate-precipitation method, as applied to the analysis of chlorpromazine in liver tissue. Mrs. Macey presented a paper entitled "The Application of Freeze-Drying in Toxicology" at the 18th Annual Meeting of the Canadian Society of Forensic Science, Banff, Alberta, Sept. 23-25, 1970.

An investigation was also carried out into some other aspects of the analytical toxicology of chlorpromazine, a prototype of the phenothiazine tranquillizers which are frequently encountered in case work. This project involved the collection of analytical data for this drug and its major metabolites, as well as a preliminary investigation of the degree of tissue protein-binding.

Another project dealt with diazepam, a tranquilizing drug, which is often involved in cases of suspected Impaired Driving. Detection of this drug in urine, which is usually the only specimen submitted for analysis in this type of case, has posed problems because the drug is changed in the body and is excreted mainly as oxazepam glucuronide. This project was undertaken to evaluate the procedure for the detection of oxazepam and apply it to the urine of patients on diazepam therapy.

A research study aimed at the development of a method to determine the presence of some of the constituents of marihuana (cannabinoids) in body fluids and tissues was started late in the year and is still in progress. This is an extremely difficult task of considerable forensic importance since no reliable analytical procedure exists to adequately demonstrate the constituents of marihuana in the body following the usage of the drug.

Two shorter projects were carried out by students during the summer months. One dealt with a re-evaluation of the quantitative procedures for barbiturates and salicylates in blood, and the other involved the gathering of gas chromatographic background data on a number of barbiturate-free blood extracts.

Two papers were published during the year—

1. "Preparative Gas Chromatography as a Clean-up Procedure in Toxicology," F. McAuley and J. Kofoed, *J. Chromatog.*, 50 (1970) p. 513.
2. "Differentiation of Phenothiazine Derivatives by Locating Agent on Thin-Layer Chromatographic plates," C. Korczak-Fabierkiewicz and G. Cimbura, *J. Chromatog.*, 53 (1970) p. 413.

ILLUSTRATIVE CASES

1. A man and his female companion were found unconscious on a Monday afternoon inside the tightly closed cabin of a sailboat anchored in a Northern Ontario bay. The victims were immediately removed to a hospital where the woman died shortly after admission. The man, although critically ill, eventually partially recovered but remained paralyzed. Preliminary police investigation disclosed that the couple apparently became sick around midnight Saturday after eating dinner prepared on a charcoal barbecue which was started on the deck and brought inside the cabin sometime later. Due to certain peculiar circumstances, the possibility of a criminal action was being considered.

Exhibits for toxicological examination consisted of tissue specimens from both victims as well as foods and other materials collected from the scene. Since the preliminary investigative report was suggestive of carbon monoxide poisoning, the blood specimens were first tested for carbon monoxide with negative results. This was followed by an extensive examination for other possible drugs and poisons including bacterial toxins (food poisoning). No significant findings were obtained. As more detailed information was available from the survivor, the original suspicion of carbon monoxide became even stronger. Under certain circumstances, the absence of carbon monoxide in blood could be explained on the basis of the time lapse between the exposure and the discovery. Carbon monoxide which may have been present in the blood originally would have been removed in the course of several hours providing that the air they breathed became free of carbon monoxide.

In order to investigate this hypothesis, two members of the section travelled to the scene and set up experiments on the sailboat to simulate the chain of events described by the survivor. The charcoal barbecue was started on the deck and then brought inside the cabin after the coals turned white. Measurements of the resulting levels of carbon monoxide in the cabin indicated that concentrations capable of causing severe poisoning were built up and then declined with time. This type of exposure was consistent with the illness and the prolonged survival of the victims.

In view of the results obtained from this experiment and in the absence of findings of drugs or poisonous substances in the specimens from the victims, it was possible to suggest that this unfortunate accident was probably caused by carbon monoxide.

This case is an excellent illustration of the insidious nature of carbon monoxide poisoning encountered very frequently in case work but perhaps not publicized enough.

2. A 19 year old youth died a few hours after being admitted to the emergency department of a Toronto hospital in a delirious state and suffering from convulsions. There was a prior history of drug use and sniffing of methylenedioxymphetamine (M.D.A.) was suspected in particular. Results of the autopsy did not reveal any cause of death and the body specimens were submitted for toxicological examination. Elevated levels of M.D.A. were found in the body specimens of the victim, and no other drugs or poisons were detected. In our opinion, there was a strong possibility that death was caused by M.D.A.

This drug is a recent addition to the group of reportedly hallucinogenic drugs which are becoming increasingly popular with young people. This case illustrates the increased complexity of the work in the Toxicology Section. New drugs such as M.D.A. are being encountered for the first time and each such encounter requires the time consuming development of appropriate methods of analysis. Also, since M.D.A. and most of the other drugs in this category are not used legitimately, there is insufficient information about their effects on the body, which makes meaningful interpretation of the findings very difficult.

PHOTOGRAPHY

Photography conducts examinations of physical matches and comparisons that are not visible to the unaided eye. The types of exhibits range from plastics and tubing to garments and labels. Photography can also produce information that is not available by any other means. For example, it may reveal the original writing on altered or obliterated documents such as cheques and drivers' licences. It may reveal bleached laundry marks on clothing and images on black polaroid carbons. It can show foreign inclusions in wood and the inside structure of metals. Stolen cameras and works of art may also be identified. Invisible information on a large spectrum of exhibits can be made visible with ultra-violet and infrared radiation, x-rays and various other special techniques.

The total number of photographs that were made rose from 8,971 in 1969 to 9,209 in 1970, an increase of 2.6%. Of these, 6,009 were for court submissions and 3,200 were for reference and educational purposes.

RESEARCH AND DEVELOPMENT

Infrared photography has been used successfully on a variety of analytical problems since infrared radiation reflects and transmits differently from visible radiation and therefore may reveal hidden information. One difficulty with this technique is that infrared rays focus on a different plane from visible radiation. Thus, when a subject is focused with visible radiation but photographed with infrared radiation, the photo is blurred. None of the normal corrective techniques are satisfactory when attempts are made to separate fine detail at a magnification range from 2 to 25 times.

To overcome this problem, a micro stage was acquired and a dial micrometer attached to it. This micrometer records up and down movement of the stage to 0.01 millimeters. A reference chart was developed to show the different focus corrections that had to be made for different magnifications. The precision so obtained permits infrared examinations in a magnification range to which there was no previous access.

The test subject (Fig. 11a) was a segment of an obliterated signature photographed at a magnification of seven. The infrared photomicrograph (Fig. 11b) not only reveals the original writing but also shows clearly the line quality of a ball point pen.



FIG. 11a

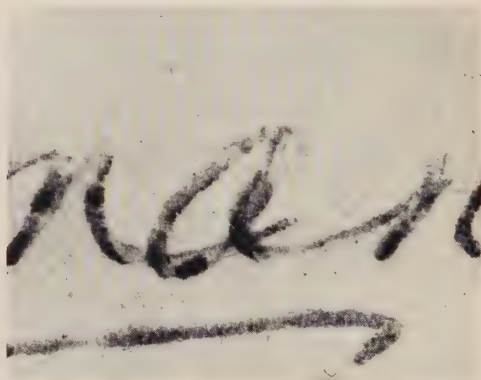


FIG. 11b

ILLUSTRATIVE CASES

1. Early one morning, a police officer had occasion to check an auto. A search revealed four tires and wheels in the back seat. A few hours later, a citizen reported to the police that there was an abandoned 1969 Mustang on the road outside his farm. When the police checked it, they discovered that it had been reported stolen and that it was minus its four tires and wheels. The seized tires and wheels and the brake drums from the abandoned car were submitted to the Centre.

Examination revealed streaks of black paint on one of the wheels and one of the brake drums. The problem of showing these patterns was enhanced by the fact that they were dark in tone and resting on a dark drum.

A number of high contrast photographs were made. Fig. 12 shows the central portion of one wheel surrounded by the mirror image of a brake drum. A large number of the radial pattern streaks on the wheel match similar patterns on the brake drum. The accused pleaded guilty to possession of stolen property.

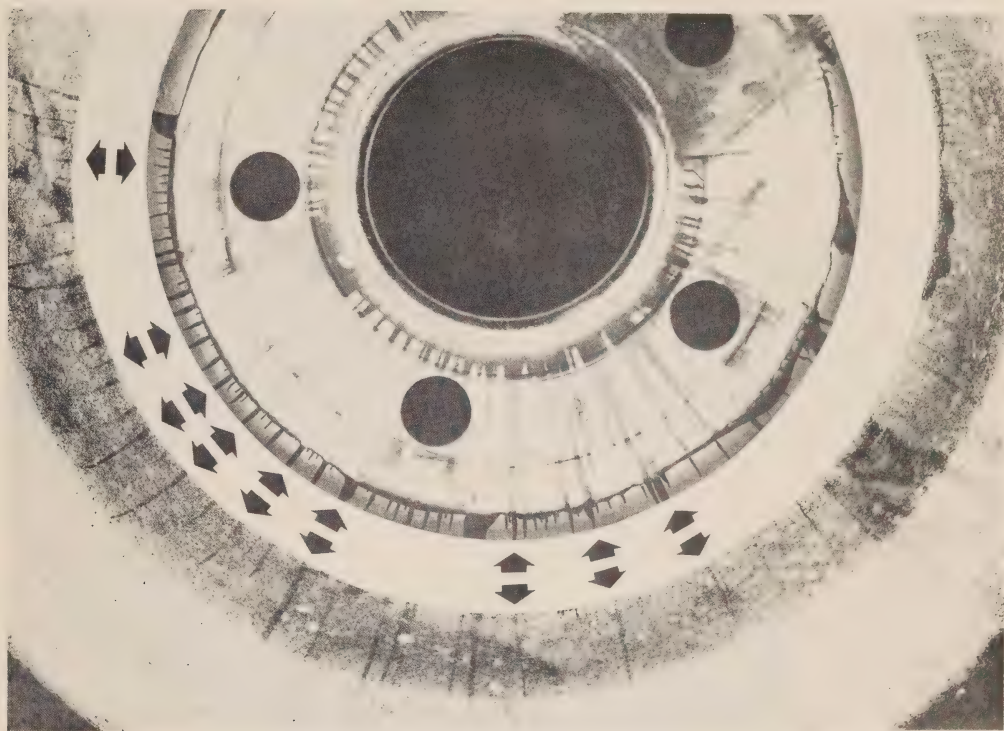


FIG. 12

2. A pair of trousers worn by a pedestrian who had been hit by a car one night were submitted for examination. The driver of the car reported the accident, but claimed that the victim was lying on the street when he was hit. No paint chips or chrome pieces were found at the scene or on the trousers, and no tire impressions were apparent on the trousers.

Examination of the trousers with various radiations and filters were tried to no avail. However, extensive visual examinations with oblique light eventually revealed some vague patterns. To amplify these patterns, a series of high contrast photos was made, one of which is shown in Fig. 13a. Further photographic intensification and reversal of the image revealed the figures 00-13 (Fig. 13b). These figures denote part of a tire size. Another photo (Fig. 13c) of another area revealed the letters "Y R A T." These letters could very well

be part of the words **PLY RATING**. The five parallel lines that are visible in all photos are characteristic of the tires made by the Goodrich Rubber Co.

The information extracted from the photos corresponded to the inscriptions on the tires taken from the suspect car. No evidence could be found to indicate that another car had also struck the victim.



FIG. 13a



FIG. 13b



FIG. 13c

APPENDIX A.
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Mrs. E. C. Kang, B.S.M.T.
Mrs. S. Fitzsimmons
Mr. U. Ghani
Mrs. G. Uchimar, Secretary

PHOTOGRAPHY

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APPENDIX B.

BREATHALYZER PROGRAMME 1970

As a result of the amendments to the Criminal Code related to drinking and driving which came into force on December 1, 1969, there was an increased interest in breath testing in 1970. Many police departments requested training for their officers in order to start a breath testing programme while other departments requested training of additional officers to enlarge their existing programme. The number of requests for the placement of equipment increased and several municipal departments purchased their own units.

Six training courses were conducted during 1970. Five of these were at the Ontario Provincial Police College while the other was conducted at #3 District Traffic Headquarters of the Metropolitan Toronto Police. Of the 201 officers who attended the courses, 181 successfully completed the course and were certified as Breathalyzer Operators. These officers were subsequently designated by the Minister of Justice and Attorney General for the Province of Ontario as "qualified technicians" as defined in Section 224A of the Criminal Code.

Eighty-six operators from the Ontario Provincial Police and 95 operators from municipal departments were designated as "qualified technicians" in 1970. This brought the number of officers designated to date to 624.

As of December 31, 1970, the total number of officers who have qualified as Breathalyzer Operators was 857—442 with the Ontario Provincial Police and 415 with municipal police departments.

During 1970, Breathalyzers were put into operation at 9 Provincial Police detachments and at 16 municipal police departments. As of December 31, 1970, Breathalyzers were located at 63 detachments of the Ontario Provincial Police and at 43 municipal police departments. The total number of Breathalyzers in service was 114. The placement of the new units was as follows:

O.P.P.

1. Hearst
2. Mount Forest
3. Rockland
4. Snelgrove
5. Madoc
6. Wawa
7. Lancaster
8. Napanee
9. Midland

MUNICIPAL POLICE

- | | |
|--------------------|-------------------|
| 1. Niagara Falls* | 9. Elliot Lake |
| 2. Saltfleet Twp. | 10. Georgetown |
| 3. Pickering Twp.* | 11. Smiths Falls* |
| 4. Brampton* | 12. St. Thomas* |
| 5. Chinguacousy* | 13. Tillsonburg* |
| 6. Fort Frances* | 14. Chatham |
| 7. Welland | 15. Dundas |
| 8. Trenton | 16. Windsor* |
- * Departments which purchased a Breathalyzer.

There was a significant increase during 1970 in the use of the Breathalyzer. In 1969, Breathalyzer Operators interviewed 17,088 persons for driving offences and 954 for non-driving offences pertaining to the Liquor Control Act or to the Criminal Code. During 1970, a total of 30,704 subjects were interviewed, 29,716 for driving offences and 988 for non-driving offences. There were 882 persons tested in connection with charges under the Liquor Control Act and 106 for charges under the Criminal Code other than driving offences.

Of the 29,716 drivers interviewed during 1970, 2,575 or 8.7% refused to take a breath test. Of the 27,141 who were tested 24,880 were charged with an offence under Section 222 and/or Section 224 of the Criminal Code. This substantial increase in the number of drivers tested was not due solely to the increase in the number of Breathalyzers in service. In 1969, 56 Provincial Police detachments who had a Breathalyzer available for the full year reported 5,578 interviews, 503 refusals and 5,074 tests conducted. The same detachments in 1970 reported 10,693 interviews (drivers only), 587 refusals and 10,106 tests conducted. There was a smaller increase with the municipal departments. Thirty-four departments (excluding Metropolitan Toronto) reported 5,237 interviews, 1,061 refusals and 4,165 tests in 1969. The same departments reported 8,173 drivers interviewed, 768 refusals and 7,045 tests in 1970. Metropolitan Toronto Police interviews increased from 6,899 to 7,989 and the number of subjects tested from 5,417 to 6,986.

The provisions in the Criminal Code for compulsory breath tests did not result in an unreasonable increase in the proportion of drivers with low blood alcohol levels being required to submit to breath analysis. In 1969, there were 1,111 or 7.9% of 14,079 drivers tested who were not charged due to low blood alcohol levels. In 1970, there were 2,261 or 8.4% of 27,141 drivers who were not charged due to low blood alcohol levels.

MUNICIPAL POLICE DEPARTMENTS

LOCATION	INTERVIEWS	REFUSALS	TESTS	TESTED		CHARGED 222 or 224 C.C.C.
				NO CHARGE LOW RESULT		
Ancaster*	16	2	14	0		14
Belleville	208	12	196	14		182
Brampton**	264	27	237	45		192
Brantford	247	13	234	10		224
Brockville	183	12	171	18		153
Burlington*	154	13	141	12		129
Chatham**	127	8	119	1		118
Chinguacousy Twp.**	75	7	68	2		66
Cornwall	155	11	144	3		141
Dryden*	11	1	10	2		8
Dundas**	23	4	19	1		18
Elliot Lake**	13	1	12	2		10
Fort Frances**	64	1	63	3		60
Galt	131	10	121	3		118
Georgetown**	66	19	47	8		39
Gloucester*	86	8	78	11		67
Guelph	147	11	136	4		132
Hamilton	668	148	520	11		509
Kapuskasing	34	0	34	7		27
Kingston	224	12	212	11		201
Kitchener	572	49	523	18		505
Lindsay*	45	1	44	2		42
London	710	57	653	31		622
Metropolitan Toronto	7,989	1,003	6,986	1,045		5,941
Mississauga	341	47	294	30		264
Nepean Twp.*	61	6	55	3		52
Niagara Falls**	107	1	106	8		98
North Bay	172	17	155	18		137
Oakville	232	26	206	28		178
Orillia	143	11	132	13		119
Oshawa	588	27	561	17		544
Ottawa	643	65	578	39		539

MUNICIPAL POLICE DEPARTMENTS

LOCATION	INTERVIEWS	REFUSALS	TESTS	TESTED	
				NO CHARGE LOW RESULT	CHARGED 222 or 224 C.C.C.
Pembroke*	58	12	46	3	43
Peterborough*	131	11	120	1	119
Petrolia*	9	1	8	0	8
Pickering Twp.**	221	16	205	27	178
Port Credit*	47	1	46	2	44
Preston*	56	7	49	1	48
Richmond Hill	184	19	165	7	158
St. Catharines*	98	4	94	7	87
St. Thomas**	53	5	48	3	45
Saltfleet Twp.**	79	9	70	2	68
Sarnia	351	25	326	13	313
Sault Ste. Marie	237	15	222	14	208
Smith Falls**	74	7	67	2	65
Stratford	109	6	103	6	97
Sudbury	462	23	439	29	410
Teek Twp*	34	2	32	2	30
Thunder Bay	342	22	320	22	298
Tillsonburg**	24	1	23	0	23
Timmins	52	5	47	5	42
Trenton**	57	13	44	6	38
Vanier*	33	7	26	6	20
Waterloo	187	22	165	10	155
Welland**	107	2	105	5	100
Windsor	385	58	327	14	313
Woodstock	50	3	47	2	45
TOTAL	17,939	1,926	16,013	1,609	14,404

*Breathalyzer not located at that Department

**Breathalyzer in service part year only

ONTARIO PROVINCIAL POLICE

LOCATION	INTERVIEWS	REFUSALS	TESTS	NO CHARGE LOW RESULT	TESTED	CHARGED 222 or 224 C.C.C.
Chatham	336	13	323	12		311
Essex	231	10	221	1		220
Petrolia	146	15	131	10		121
London	229	15	214	3		211
St. Thomas	218	11	207	8		199
Tillsonburg	107	10	97	6		91
Woodstock	140	3	137	12		125
Brantford	44	3	41	0		41
Burlington	158	3	155	7		148
Milton	167	19	148	17		131
Oakville*	93	8	85	7		78
Simcoe	230	15	215	11		204
Waterdown	146	11	135	14		121
Cayuga	112	10	102	6		96
Fort Erie	167	10	157	3		154
Niagara Falls	277	10	267	24		243
St. Catharines	573	14	559	33		526
Welland*	15	0	15	0		15
Brechin	72	12	60	2		58
Downsview	115	3	112	6		106
Oak Ridges	308	28	280	29		251
Port Credit	202	14	188	6		182
Snelgrove**	64	4	60	0		60
Whitby	331	23	308	16		292
Goderich	176	10	166	4		162

ONTARIO PROVINCIAL POLICE

LOCATION	INTERVIEWS	REFUSALS	TESTS	TESTED	
				NO CHARGE LOW RESULT	CHARGED 222 or 224 C.C.C.
Guelph*	80	1	79	0	79
Kitchener*	86	10	76	0	76
Mount Forest**	191	12	179	26	153
Owen Sound	398	16	382	33	349
Sebringville*	132	13	119	5	114
Barrie	652	50	602	2	600
Bracebridge	266	18	248	20	228
Midland**	27	1	26	3	23
Orillia*	31	4	27	0	27
Brighton*	48	3	45	3	42
Cobourg	183	12	171	8	163
Lindsay	170	10	160	3	157
Newcastle	111	3	108	14	94
Peterborough	165	12	153	6	147
Bancroft	51	2	49	1	48
Belleville	239	9	230	13	217
Kingston	198	4	194	9	185
Madoc**	86	8	78	3	75
Napanee**	58	1	57	1	56
Brockville	146	10	136	6	130
Pembroke	344	14	330	16	314
Perth	126	6	120	6	114
Hawkesbury	100	2	98	3	95
Lancaster**	56	3	53	1	52
Long Sault	230	8	222	15	207
Ottawa	307	31	276	51	225

ONTARIO PROVINCIAL POLICE

LOCATION	INTERVIEWS	REFUSALS	TESTS	TESTED	
				NO CHARGE LOW RESULT	CHARGED 222 or 224 C.C.C.
Rockland**	121	6	115	13	102
Burk's Falls	61	2	59	10	49
Haileybury	104	3	101	15	86
Kirkland Lake	63	4	59	5	54
North Bay	164	3	161	8	153
Parry Sound	104	8	96	13	83
Chapleau	41	2	39	2	37
Little Current	200	5	195	9	186
Sudbury	503	23	480	8	472
Blind River	126	6	120	12	108
Elliot Lake*	5	0	5	0	5
Sault Ste. Marie	84	5	79	1	78
Wawa**	46	3	43	2	41
Hearst**	68	3	65	3	62
Kapuskasing*	61	3	58	8	50
South Porcupine	207	4	203	13	190
Nipigon	150	11	139	10	129
Thunder Bay	161	10	151	4	147
Dryden	211	4	207	20	187
Emo	63	2	61	7	54
Kenora	96	5	91	4	87
TOTAL	11,777	649	11,128	652	10,476

*Breathalyzer not located at that Detachment

**Breathalyzer in service part year only

BREATHALYZER ONTARIO PROVINCIAL POLICE - MUNICIPAL POLICE

TOTAL FOR YEAR	INTERVIEWS	REFUSALS	TESTS	TESTED		TESTED NON-DRIVING OFFENCE
				NO CHARGE LOW RESULT	CHARGED 222 or 224 C.C.C.	
1970	29,716*	2,575 8.7%	27,141	2,261 8.4% of Tests	24,880	988
1969	18,042	3,067 17%	14,963	1,111 7.4% of Tests	12,968	954
1968	16,100	3,629 22.5%	12,429	811 6.5% of Tests	10,902	752
1967	13,376	3,548 26.5%	9,707	763 7.9% of Tests	8,533	623
1966	12,206	3,268 26.8%	8,893	823 9.3% of Tests	7,846	635

*The number interviewed refers to drivers only for 1970.

In the other years the number interviewed includes those who were tested for non-driving offences.



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